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THE RELATIONSHIP OF GADGET ADDICTION ON MENTAL HEALTH IN MEDICAL STUDENTS

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Abstrak

Smartphone, is a term to distinguish advanced feature phones from basic feature phones. Excessive smartphone use or addiction can lead to negative health consequences such as neck pain, accidents, anxiety, depression, and sleep disorders. This study aims to determine how the influence of gadget use addiction on mental health in medical students. Method used (narrative review/systematic review with PRISMA 2020). Research was collected through searches on Google Scholar from 2019 to 2023, Ebscho from 2019 to 2023 with full text limits and PubMed from 2019 to 2023. The keyword searches used are smartphone addiction, mental health, and medical student. 210 results were found from Google Scholar, 15 results were found on Ebscho, 31 results were found on PubMed, and 21 studies were included in the study. Results of the 256 journals netted, there are 21 journals that match the category of literature review titles. There is a significant relationship between gadget addiction to mental health in medical students, especially in women.

Keywords: *mental health, smartphone addiction, medical student*

1. Introduction

Advances in smartphone technology have attracted the interest of every generation, including students at the higher education level. However, smartphone use can lead to problematic and addictive use, which might affect a person's psychological well-being (Hadi, et.al, 2019).

Smartphone, is a term to distinguish advanced feature phones from basic feature phones. The term "Smartphone" first appeared in 1997, when Ericsson described the GS 88 "Penelope" concept as a smartphone. The term is basically introduced in the market of a new class of mobile phones that provide integrated services of communication, such as messaging or SMS, voice communication, online gaming, online shopping, website browsing, social networking, personal information management applications, and wireless communication capabilities (Kalyani, et.al, 2019).

Smart phones have brought drastic changes in people's lives. This technology has radically changed our daily lives and nowadays people use smart phones very often and it has become the first thing we look for when we wake up in the morning and is often the last thing we check before going to bed at night (Kalyani, et.al, 2019).

Today, technology is developing rapidly, especially the use of smartphones. Smartphone addiction is considered a dependence that often causes excessive desire. While there are benefits such as connectivity and increased productivity, over-addiction can negatively impact health, including neck pain, accidents, anxiety, depression, poor academic performance, and sleep disorders (Kalyani, et.al, 2019).

Smart phone addiction is physical or psychological damage to a person due to excessive use of smart phones, which is also referred to as smartphone use disorder. Smartphone addiction has some of the same clinical symptoms as other behavioral addictions, such as gambling disorders and gaming disorders (Li & Wang, 2022).

2. Method

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The method used is systematic review with PRISMA 2020. Studies were collected through searches on Google Scholar by finding 210 studies, Ebscho by finding 15 studies, PubMed by finding 31 results and 10 studies included in this review in the range of 2019-2023 after being selected using inclusion and exclusion criteria. The method used to write this article is literature review by searching journals on Google Scholar, PubMed and Ebscho with keywords: (1) mental health (2) smartphone addiction (3) medical student. The inclusion criteria of this study are considered appropriate to conduct a systematic review are: (1) Target group: Medical students, (2) Results: The Relationship of Gadget Use Addiction with Mental Health in Medical Students, (3) Research Methods: Literature Review, (4) Studies discussed in Indonesian. The author filters out irrelevant research titles and abstracts. The author chooses sampling and methods, if the journal does not discuss the Relationship of Gadget Use Addiction with Mental Health in Medical Students, the document is excluded. The author examines research written in English and Indonesian, with a publication year range of 2019 – 2023. The search for data on references and sources will begin in December 2023. Filtering is done based on relevant titles and abstracts from the full paper.

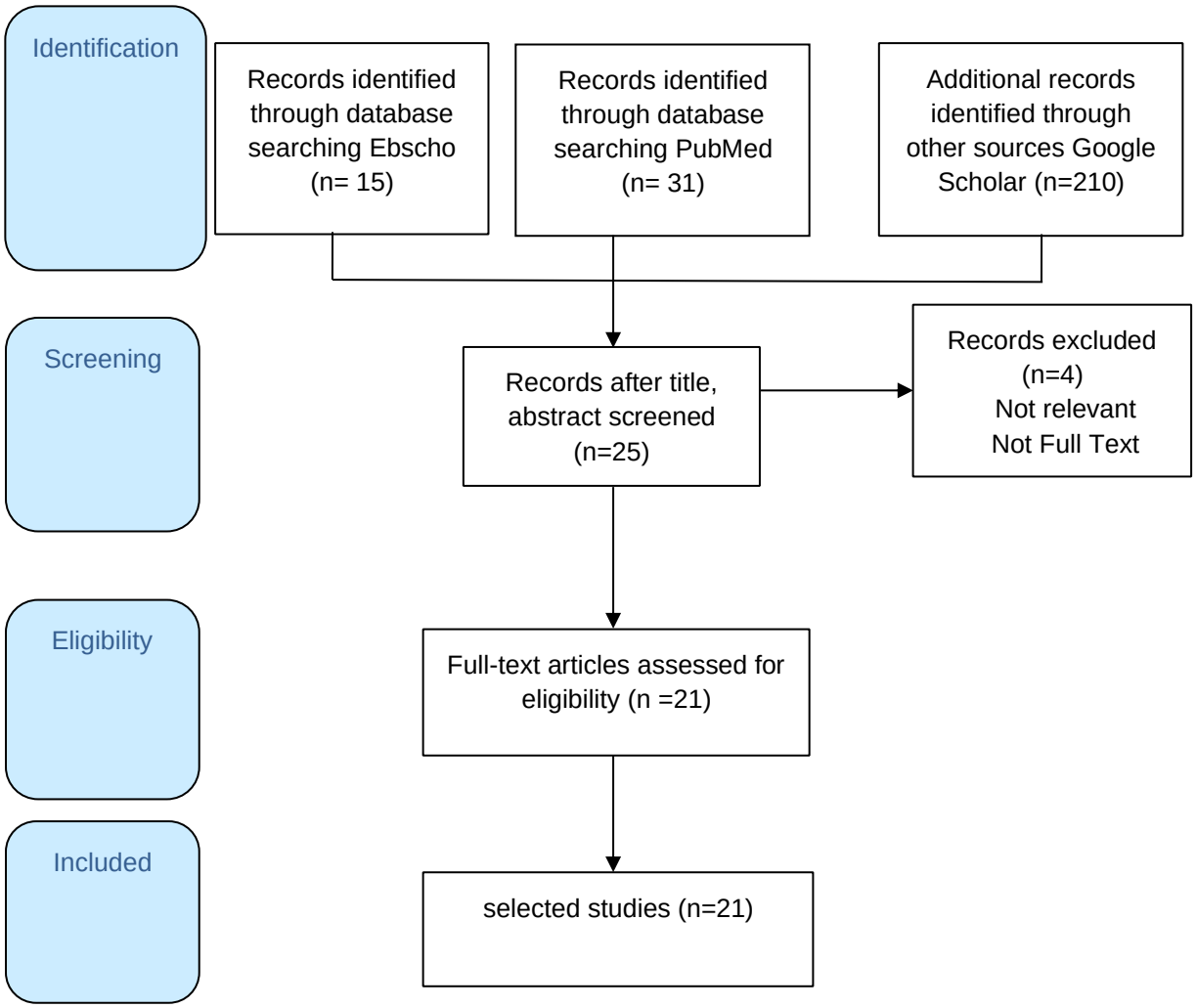

Figure 1. Study Selection

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3. Results and Discussion

Tabel 1. Result of Literature Review

No.	Author and Title of Research	Research Objectives	Location	Research Methods	Research Results
1	Abdul Hadi A, Mohd Nawawi HM, Shamsuri N, Rahim NN, Pasi H. ***"Smartphone addiction and its relationship with psychological health among students of a medical school in East Coast Malaysia.***	The study aimed to measure the prevalence of smartphone addiction and its relationship with psychological health among clinical-year medical students at the International Islamic University Malaysia (IIUM), Kuantan.	International Islamic University of Malaysia (IIUM), Kuantan	Online-based questionnaires	At IIUM, 51% of clinical year medical students report having a smartphone addiction. Bivariate analysis revealed that most students chose social networks as their primary destination for smartphone use, and this was significantly associated with smartphone addiction ($p = 0.037$). Based on multiple logistic regression analysis, students who chose gaming as their primary goal for smartphone use were 88% less likely to develop smartphone addiction ($p = 0.009$, 95% CI: 0.025–0.595) compared to those who used it for daily activities. academic performance tasks. Students who were not addicted to smartphones reported a significantly better psychological quality of life than students who were addicted ($p<0.001$)

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2	Gica, S., Yunden, S., Kirkas, A., Sevil, F., Ozdengul, F., & Ak, M. (2020). ***"The Effect of Social Media / Smartphone Addiction and Sleep Quality on Academic Success in Medical Faculty Students."***	The aim of our study was to evaluate the effect of smartphone/social media use and sleep-related variables on academic success in students receiving pre-clinical medical education.	Medical Faculty Students. Selcuk University	*Pittsburg Sleep Quality Index* (PSQI), *Social Media Addiction Scale - Adult Form* (SMDS-YF), dan *Smartphone Addiction Scale* (ATBS).	Based on the risk of smartphone addiction, the average Academic Score (AAM) of the low risk group was 71.8 ± 8, the average AAM score of the moderate risk risk group was 68.4 ± 8.77, and the average score. The AAM of the high dependency risk group was 67.4 ± 9.75. The average AAM score in the risk group was low in terms of: Smartphone addiction was significantly higher than in the high-risk group. The total score of social media addiction in the high-risk group in terms of smartphone addiction was significantly higher than in the medium and low-risk groups.
3	Choksi, S. T., & Patel, N. (2021). ***"A study to find out the correlation of mobile phone addiction with anxiety, depression, stress and sleep quality in the college students of Surat city."***	Examining the relationship between mobile phone use and mental health by measuring levels of depression, anxiety, stress and sleep quality in students in the city of Surat.	The college students of Surat city	*Cross-sectional,* with 3 questionnaires including depression, Anxiety and Stress scale (DASS), Insomnia assessed using *Athens Insomnia Scales (*AIS), and Smartphone addiction scale – Short version (SAS-SV).	Statistical analysis shows that 27% of students experience smartphone addiction. Stress, anxiety, depression, and sleep quality had a significant positive correlation with *smartphone addiction* ($p<0.05$). Anxiety ($p = 0.000$) and stress ($p = 0.000$) were highly correlated with smartphone addiction, followed by depression (0.002) and sleep quality (0.004). The results point to a high likelihood of anxiety and stress for mobile phone addicts.

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4	Paudel L, Sharma P, Kadel AR, Lakhey K, Singh S, Khanal P, Sharma R, Chalise P, Sharma SC, Pradhan SN. ***"Association Between Internet Addiction, Depression and Sleep Quality Among Undergraduate Students of Medical and Allied Sciences".***	The study aimed to assess the burden of internet addiction among nursing, dentistry and medical students at a medical school, and examine its association with depression and sleep quality.	Medical Faculty Students. Nepal	*Cross-sectional,* Young's internet *addiction test*, Beck*'s depression inventory,* and Pittsburgh's *Sleep Quality Index questionnaire*	The majority of respondents reported controlled internet use or experienced mild problems in internet use. However, 4.7% of respondents reported significant problems due to internet use. Further, about 42.3% reported poor sleep quality, and 8.9% tested positive for depression. In chi-square analyses *and* logistic regression, internet addiction was significantly associated with poor sleep quality and depression.
5.	Sserunkuuma J, Kaggwa MM, Muwanguzi M, Najjuka SM, Murungi N, Kajjimu J, Mulungi J, Kihumuro RB, Mamun MA, Griffiths MD, Ashaba S. ***"Problematic use of the internet, smartphones, and social media among medical students and relationship with depression: An exploratory study".***	The study explored the link between problematic internet, social media, and smartphone use and depressive symptoms among Ugandan medical students.	Ugandan Medicine	Using surveys on socio-demographic factors, lifestyle, *online* usage behavior, smartphone addiction, social media addiction, and internet addiction.	The findings showed that 16.73% of medical students had moderate to severe depressive symptoms. The prevalence of smartphone addiction was 45.72%, social media addiction was 74.34% and internet use addiction was 8.55%. *Online* use behaviors (e.g., average hours spent *online, type of social media* platform used, purpose of internet use) and online-related addictions (smartphones, social media, *and* internet) are estimated to account for approximately 8% and 10% of the severity of depressive symptoms. However, over the

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					past two weeks, stressors in life had the highest predictability of depression (35.9%). The final model estimated a total of 51.9% variance for depressive symptoms. In the final model, romantic relationship problems (ß = 2.30, SE = 0.58; p<0.01) and academic achievement problems (ß = 1.76, SE = 0.60; p<0.01) over the past two weeks; and increased severity of internet addiction (ß = 0.05, SE = 0.02; p<0.01) was associated with a significant increase in the severity of depressive symptoms, whereas Twitter use was associated with a decrease in the severity of depressive symptoms (ß = 1.88, SE = 0.57; p < 0.05)
6	Nikolic A, Bukurov B, Kocic I, Vukovic M, Ladjevic N, Vrhovac M, et al.***"smartphone addiction, sleep quality, depression, anxiety, and stress among medical students."***	This study specifically aimed to investigate this relationship among medical students in Belgrade and Nis (Central Serbia).	Medical students in Belgrade and Nis (Central Serbia)	*The cross-sectional study* involved a sample of 761 students, selected from the Medical Faculties of the University of Belgrade and the University of Nis. Questionnaire Filling, and Statistical Analysis Techniques.	The findings showed the prevalence of smartphone addiction among medical students at 21.7%, with rates of 22.9% in males and 21.1% in females. Women showed significantly higher scores on the SAS-SV scale than men (p = 0.032). Univariate logistic regression analysis revealed a significant association between smartphone addiction and spending more than 4 hours daily using smartphones

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					(OR = 2.39; p
7	Stanković M, Nešić M. ***"Association of internet addiction with depression, anxiety, stress, and the quality of sleep: Mediation analysis approach in Serbian medical students."***	This cross-sectional *study investigated the behavioral mechanisms underlying the relationship between IA and depression in* a two-way pathway, and the extent to which the IA-depression relationship was mediated by anxiety, stress, and sleep quality in medical students	Faculty of Medicine, Department of Physiology, University of Niš, Serbia	*This cross-sectional study* investigated the behavioral mechanisms underlying the IA-depression association, mediated by anxiety, stress, and sleep quality in a sample of Serbian medical students (N = 161). Participants completed paper and pen questionnaires including *the Internet Addiction Test* (IAT);	The frequency and percentage of Internet use per day are: less than an hour (2.5%); up to 3 hours (41%), up to 6 hours (41.5%), more than 6 hours (15%); Internet use per week: up to 6 hours (5%), up to 12 hours (11.8%), up to 24 hours (41%), more than 24 hours (42.2%) and the purpose of using the Internet were to look for information/educating myself (27.4%), seeking pleasure and entertainment (63; 39.1%), reducing loneliness (4; 2.5%), spending time (35; 21.7%) and others (15; 9.3%). According to the IAT normative score (Young, 1998), 42.8% participants showed no excessive Internet

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				self-report questionnaire on Internet usage; The Depression, Anxiety and Stress Scale (DASS-21), and *the Pittsburgh* Sleep Quality Index (PSQI).	use, 49.1% showed mild levels of IA, and 8.1% belonged to the moderate IA range. These results provide evidence of a two-way hybrid pathway between IA and depression, highlighting the mediating role of anxiety and stress.
8	Kalyani B, Narasimha Reddi K, Ampalam P, Kishore D, elluru S, Graduate P, et al. ***"Depression, anxiety and smartphone addiction among medical students."***	The aim of the study was to determine the prevalence of smartphone addiction among medical students and to assess its impact on sleep quality	Department Of Psychiatry, Maharajah's Institute Of Medical Sciences, Vizianagaram. Andhra Pradesh, India.	This study was a *cross-sectional* study conducted on undergraduate medical students of medical schools. Semi-structured proforma containing participants' *Smartphone* use characteristics, Smartphone Addiction Scale *(*SAS-SV), Depression, Anxiety and Stress Scale (DASS-21).	The majority of study participants were women (60.4%). The prevalence of smartphone addiction among participants was 29.6%, of whom 37.3% were male and 24.5% female. Smartphone addiction in male students was significantly related to *gaming* applications, while the use of multimedia services and social networks in female students. Anxiety and Depression were found to be higher in males whereas the effects of stress were higher in female participants
9	Li Y, Li G, Liu L, Wu H. ***"Correlations between mobile phone addiction and anxiety, depression, impulsivity, and poor sleep quality among college students: A***	This study aimed to determine mobile phone addiction (MPA) which correlates with anxiety, depression, stress, impulsivity, and sleep quality among college students.	Department of Social Medicine, School of Public Health, China Medical University, Shenyang, People's Republic of China. Department of	A systematic review and meta-analysis was conducted by searching PubMed, Embase, *Cochrane Library, Wanfang,* China	Forty studies involving a total of 33,650 college students were identified. Weak to moderate positive associations were found between MPA and anxiety, depression, impulsivity, and sleep quality (anxiety : *summary* r = 0.39, 95% CI = 0.34–0.45, P <

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systematic review and meta-analysis."	Medical Record Management Center, the First Affiliated Hospital of China Medical University, Shenyang, People's Republic of China.	National Knowledge Infrastructure (CNKI), Chinese Science and Journal of Technology (VIP) database, and Chinese Biological Medicine (CBM) database from awa to August 1, 2020. Collected Pearson correlation coefficient between MPA and anxiety, depression, impulsiveness, and sleep quality was calculated by R software using a random effects model	0.001, I2 = 84.9%; *depression: summary r = 0.36, 95% CI = 0.32–0.40, P < 0.001, I 2 5 84.2%; impulsivity: summary* r 5 *0.38, 95% CI 5 0.28–0.47, P < 0.001, I 2 5 94.7%; sleep quality: summary* r = 0.28, 95% CI = 0.22–0.33, P < 0.001, I2 = 85.6%). The aggregated correlations revealed some differences when grouped by multiple moderators. These findings were further confirmed by sensitivity analysis. Conclusion: Current meta-analyses provided strong evidence that MPA is positively correlated with anxiety, depression, impulsivity, and sleep quality. This suggests that college students with MPA are more likely to develop high levels of MPA anxiety, depression, and impulsivity and suffer from poor sleep quality.

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10	Alabdallat YJ, Albakri KA, Al-Hanaqtah BM, Al-Dajani MH, Saleh OM, Harvey H. ***"The Association between Smartphone Addiction, Depression and Anxiety among Medical Students in Jordan."***	The study aimed to investigate the relationship between depression, anxiety, and smartphone addiction among medical students in Jordan	Faculty of Medicine, The Hashemite University, Zarqa, Jordan.	A *cross-sectional* study was conducted using *an online structured questionnaire*. The survey was completed by 164 male and female medical students who were grouped on the basis of years one through three in the Medical Sciences base . The survey consisted of items from Generalized *Anxiety Disorder (*GAD-7), Patient Health Questionnaire (PHQ-9), and Short Version of Smartphone Addiction Scale (SAS-SV), in addition to two questions regarding the impact of the COVID-19 pandemic on smartphone addiction.	Among the participating students, the median age was 18.9 years, with nearly half (47.2%) being first-year students. The results showed no significant difference in stress, anxiety or cell phone addiction based on gender or school year. The logistic regression model was not statistically significant to the covariates, except GAD, which had OR=1.15 (CI: 1.06 -1.25). Furthermore, SAS-SV was positively correlated with GAD-7 and PHQ-9 scores (r=0.42, r=0.2, p<0.000, p=0.029, respectively)

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11	Zhang, C., Zeng, P., Tan, J., Sun, S., Zhao, M., Cui, J., ... & Liu, D. (2021). ***"Relationship of problematic smartphone use, sleep quality, and daytime fatigue among quarantined medical students during the COVID-19 pandemic"***	The study examined the association of *smartphone* use (PSU) problems, sleep quality, and daytime fatigue in medical students.	Six polyclinic hospitals in Beijing	Web-based surveys	49.70% of participants had PSU. A significant positive correlation was found between SAS-SV, AIS, and FS scores (r **=** 0.35–0.61, PS <0.001). Subjects with PSUs were more likely to report sleep disturbances **(ÿ = 1.07, P <0.001, OR = 2.91, 95%CI = 2.17–3.91), physical fatigue (ÿ = 1.16, P <0.001, OR = 3.18, 95%CI = 2.45–4.15), and mental fatigue (ÿ** = **0.88, P <0.001, OR** = 2.42 **, 95** %CI = 1,86–3,14). The indirect effect of PSU on physical fatigue and mental fatigue mediated by sleep quality accounted for 50.03 and 45.43% of the total effect, respectively.
12	Lei LYC, Al-Aarifin Ismail M, Mohammad JAM, Bahri Yusoff MS. ***"The relationship of smartphone addiction with psychological distress and neuroticism among university medical students."***	The study explored the relationship of smartphone addiction with psychological health and neuroticism among USM medical students.	USM Medicine	A *cross-sectional study* was conducted on medical students at a general medical school.	A total of 574 medical students participated in the study. The prevalence of smartphone addiction is 40.6%. This number is higher in male medical students (49.2%) than female medical students (36.6%). The results showed a fairly positive correlation between smartphone addiction and psychological health (depression = 0.277, p-value <0.001; *ranxiety* = 0.312, p-value <0.001; *rstress* = 0.329, p-value <0.001). However, there was a poor positive correlation between smartphone addiction and neuroticism (r = 0.173, p

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					value <0.001). Simple linear regression showed a significant increase in rates of depression, anxiety, stress, and neuroticism at a one-unit increase in smartphone addiction (bdepression = 0.101, p-value <0.001; banxiety = 0.120, p-value <0.001; bstress = 0.132, p-value < 0.001; bneuroticism = 0.404, p-value < 0.05). These results point to a significant association between smartphone addiction, psychological health, and neuroticism.
13	Xu, T., Sun, X., Jiang, P., Chen, M., Yue, Y., & Dong, E. (2022). ***"Effects of cell phone dependence on mental health among college students during the pandemic of COVID-19: a cross-sectional survey of a medical university in Shanghai"***	To investigate the impact of mobile phone dependence (CPD) on mental health among college students during the COVID-19 pandemic and further identify determinants that may affect their mental health in China.	Medical University in Shanghai	Data was collected from 602 students at a medical school in Shanghai through an *online* survey conducted from December 2021 to February 2022.	Among the 402 eligible students, 73.88% were women with average age 20.19 ± 2.36 years. The average DASS score was 32.20 ± 11.07, the CPD score was 36.23 ± 11.89, and the duration of mobile phone use was 7.67 ± 3.61 hours/day. CPD was found to have a negative effect on mental health among college students in Shanghai. In addition, duration of cell phone use, age, senior student years, lecturer-student relationship, insomnia, tobacco use, obesity, and life satisfaction were clarified as contributing factors to mental health among college students.

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14	Wattanaudomchai, A., Tangwongchai, S., & Lalitanantpong, D. (2023). ***"Depression, smartphone addiction, and association factors among preclinical medical students"***	To determine the prevalence and factors associated with depression to smartphone addiction behavior among Chulalongkorn University preclinical medicine students.	Faculty of Medicine, Chulalongkorn University, Bangkok, Thailand	This study was a cross-sectional descriptive study. Data was collected from preclinical medical students at Chulalongkorn University in the 2020 academic year, before the COVID-19 pandemic in Thailand.	The study recruited 343 preclinical medical students with an average age of 19.6 ÿ 1.3 years and half the subjects were male. The prevalence of smartphone addiction is 42.9%. Depression and poor sleep quality were reported in 25.4% and 11.4% of subjects, respectively. After variable adjustment from the univariate model, significant depressive factors were smartphone addiction (2,025; 95% CI 1,163 – 3,524), poor sleep quality (6,767; 95% CI 3,110 – 14,725), having an underlying physical illness (2.99; 95% CI 1,583, 5,647), being gender female (1.76; 95% CI 1,000 – 3,098, GPA < 3.5 (2,995; 95% CI 1,624 – 5,523) and not interested in studying Medicine (2,537; 95% CI 1,262 – 5,103). Factors associated with smartphone addiction were depression (2,115; 95% CI 1,263 – 3,541), drinking (3,783; 95% CI 1,248 – 11,465), interpersonal deficits (1,733; 95% CI 1,099 – 2,732) and grade 2 students (2,404; CI 95% 1.357 – 4.258).

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15	Li, L., Wang, L., & Wang, X. (2022). ***"Effect of smartphone use before bedtime on smartphone addiction behaviors among Chinese college students"***	In this study, it looked at excessive smartphone use after 9 p.m. before bed	Qingdao University, Qingdao, China	Online questionnaire. The sample consisted of 1,035 college students in China.	The results show that the usage time of the smartphone closely related to smart phone behavior, and behavior The addition of the resulting smart phone has a significant influence on sleep quality. The addition of a phone can decrease the quality of sleep, and even cause a series of sleep problems. This observation is consistent with previous research. In practice, students need to reduce smartphone use time to avoid smartphone addiction behavior.
16	Song, Y., Sznajder, K.,	The aim of this study was to explore the relationship between anxiety, problematic phone use, and sleep disturbances among medical students during the home quarantine period due to COVID-19.	Chinese Medical University, Shenyang, China	666 medical students validly answered the self-filled questionnaire	Anxiety was significantly associated with smartphone use problems and sleep disturbances among medical students during the COVID-19 pandemic. Problematic *smartphone* use not only has a direct impact on anxiety, but also exerts a significant indirect influence on anxiety through sleep disturbances.

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17	Chatterjee S, Kar SK. ***"Smartphone Addiction and Quality of Sleep among Indian Medical Students"***	The study aimed to evaluate the association of smartphone addiction and sleep quality among medical students across all semesters, as well as other background variables.	Educational hospitals in North India	This *cross-sectional* study was conducted on 224 medical students from tertiary teaching hospitals in North India using a self-administered questionnaire	The prevalence of smartphone addiction was found to be 33.33% in women and 46.15% in men. In the study, 63.39% were sleep-deprived people based on their PQSI scores, and 62.05% reported poor health status based on their GHQ scores. There was a positive correlation between overall PQSI scores and duration of smartphone use per day, SAS-SV scores, and GHQ
18	Santander-Hernández FM, Peralta CI, Guevara-Morales MA, Díaz-Vélez C, Valladares-Garrido MJ. **"Smartphone overuse, depression & anxiety in medical students during the COVID-19 pandemic"**	This study aimed to assess the relationship between excessive smartphone use and mental disorders in Peruvian medical students during the COVID-19 pandemic.	Medicine of Piura, Peru	Cross-sectional survey *study* on medical students from Piura, Peru in the context of the COVID-19 pandemic. Data collection occurred between July and October 2020	Excessive smartphone use was common among students (n = 291.79%). Depressive symptoms were present in 290 (78%) students and anxiety symptoms were present in 255 (69%). Medical students have made special use of smartphones during the COVID-19 pandemic. Our findings suggest that medical students who are excessively exposed to smartphones are vulnerable to experiencing mental disorders. Overuse may reflect an inappropriate way to find emotional relief, although excessive use of smartphones has been observed, its impact on mental disorders remains unclear. Adjusted for confounding factors, significantly addictive or dependent smartphone use

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						associated with the presence of depressive symptoms (PR = 1.29, 95% CI: 1.20–1.38 for dependent use; PR = 1.30, 95% CI: 1.12–1.50 for addictive use) . In addition, the use of smart phones that cause addiction/dependence was significantly associated with the presence of anxiety symptoms (PR = 1.59, 95% CI: 1.14–2.23 for use of dependencies; PR = 1.61, 95% CI: 1.07–2.41 for addiction use).
19	Feng Z, Diao Y, Ma H, Liu M, Long M, Zhao S, et al. ***"Mobile phone addiction and depression among Chinese medical students: the mediating role of sleep quality and the moderating role of peer relationships"***	The study examined the mediating role of sleep quality and The role of peer relationship moderation in the relationship between cell phone addiction and depression.	Chinese Medical University	The study investigated 593 second-year college students from a medical universities and accumulate mobile phone addiction, depression, peer relationships, and demographic variables. The study conducted an *online* survey during class breaks via *Wen-juanxing Questionnaire App.*	The results showed that sleep quality partially mediated the link between cell phone addiction and depression. In addition, the effect of sleep quality on depression was moderated by peer relationships. This research could improve our understanding of how and when cell phone addiction causes depression.

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20	Liu H, Zhou Z, Zhu E, Huang L, Zhang M. ***"Smartphone addiction and its associated factors among freshmen medical students in China: a cross-sectional study."***	The study aimed to investigate the prevalence of smartphone addiction among new medical students and to explore its relationship with personal, mental health, and professional identity factors.	Wannan Medical College, Tiongkok.	This cross-sectional *study* was conducted from October 10 to November 10, 2020 and involved 2,182 first-year students at *Wannan Medical College*, China. A 12-item smartphone addiction test, professional identity, and general health questionnaire were used for this *cross-sectional* survey. The Pearson correlation coefficient (r) was used to test the correlation between smartphone addiction and mental health and professional identity. Binary logistic regression analysis was performed to assess the factors affecting	Of the 2,182 students, 866 (39.7%) identified smartphone addiction. Logistic regression analysis showed that four factors (professional identity scales, poor mental health, smartphone use before bed, and perceived learning pressure) were significantly associated with smartphone addiction.

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				smartphone addiction	
21	Leow MQH, Chiang J, Chua TJX, Wang S, Tan NC. ***"The relationship between smartphone addiction and sleep among medical students: A systematic review and meta-analysis".***	Aims to evaluate the relationship between mobile phone addiction Smart and sleep in medical students.	Lee Kong Chian School of Medicine, National Technological University of Singapore, Singapore, Singapore.	Quantitative studies in languages UK on smartphone addiction and sleep in students studying Western medicine is included. Rayyan's app is used for title-abstract screening, and the *Joanna Briggs Institute's* (JBI) critical appraisal *checklist* to assess the risk of bias. Data heterogeneity	A total of 298 abstracts were initially assessed for inclusion eligibility: 16 of them were ultimately Assessed, it includes 9466 medical students consisting of 3781 (39.9%) men and 5161 (54.5%) women. The meta-correlation between the *Smartphone Addiction Scale Short Version* (SAS-SV) and *the Pittsburgh Sleep Quality Index* (PSQI) was 0.30 (95%CI = 0.24–0.36), and 0.27 (95% CI = 0.18–0.36) for SAS-SV and sleep duration. The meta-analytic estimate of smartphone addiction prevalence was 39% (95%CI = 0.30–0.50), and the score used

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		and meta-synthesis tests were performed using meta packages in R software.	SAS-SV is 31.11 (95%CI = 29.50–32.72). The average duration of daily smartphone use was 4.90 hours (95%CI = 3.72–6.08). Meta-analytical estimation of sleep deprivation prevalence was 57% (95%CI = 0.48–0.66), and the meta-mean PSQI and sleep duration were 5.95 (95%CI = 4.90–7.00) and 5.62 hours (95%CI = 4.87–6.36) respectively.

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Discussion

Education in medical school has a very broad curriculum, although only the content of theoretical knowledge is evaluated. High stress factors, academic demands, lack of free time, large responsibilities, as well as lack of social support and financial burden in medical education make students more vulnerable to symptoms of depression and anxiety compared to students from other departments. In addition to psychological disorders such as depression, anxiety, and sleep disorders, physical, social, environmental, and economic factors can also affect a student's academic success. The development of smart phone technology is also a concern for all generations, including college students (Gica, et.al, 2020).

Excessive smartphone use can have a negative impact on mental health. Some common problems associated with smartphone use include stress, anxiety, depression, attention deficit, insomnia or other sleep quality-related issues and impact academic performance (Choksi & Patel, 2021). With the development of technology over the past two decades, the use of the Internet, smart phones, and social media has become an essential part of everyday life. The widespread use of smartphones with always-on Internet access in areas such as business, education, entertainment, communication, and commerce can lead to problematic and addictive use, which can have a negative impact on one's psychological health (Gica, et.al, 2020).

A smart phone according to the Oxford Dictionary is a mobile phone that performs many of the functions of a computer and usually has a touchscreen interface, Internet access, and an operating system that can run downloaded applications. Addiction, on the other hand, is defined by the American Psychiatric Association as a condition in which a person is unable to evaluate or discern the effects of a particular thought or object rationally (Hadi, et.al, 2019).

Certain behaviors can generate short-term rewards, which can turn into long-term behaviors despite a decrease in control over the behavior, it is the basic concept of addiction. This equality creates the idea of non-material or "behavioral" addiction. Therefore, smartphone addiction here can be defined as reduced control over mobile phone use despite already knowing the negative consequences (Hadi, et.al, 2019). The study investigated the relationship between excessive cell phone use and anxiety, depression, stress, and sleep quality among medical students. According to some previous studies, the increased incidence of insomnia is due to increased emotional reactivity. Previous research has shown that SMS users are more likely to feel nervous, depressed, and anxious, which can interfere with their sleep quality (Choksi & Patel, 2021).

The study showed that prolonged cell phone use, which causes insomnia, is associated with insomnia. This increases as time spent using mobile phones increases. However, the increase in Internet use among teens and new adults has led to an increase in addictions to online-related behaviors (e.g., smartphone addiction, Internet use addiction, social media addiction), referred to as "Internet use problems." (PIU) (Sserunkuuma, et.al, 2023).

PIU is the use of the Internet that causes psychological and social difficulties in a person's life (e.g. sacrificing relationships, work, and/or education). Problematic online behavior increases the risk of mental health problems and psychological consequences such as depression, anxiety, sleep disorders, chronic stress, and low self-esteem. In addition, PIU is known to exacerbate negative family impacts for adolescents and their parents (Sserunkuuma, et.al, 2023). Internet-related activities (e.g. smartphone and social media use) reverse social bonding behaviors previously carried out through self-openness and reactivity, thus leading to superficial reactions and openness (e.g. in face-to-face interactions). shift to new maladaptive behaviors associated with having psychological problems (Sserunkuuma, et.al, 2023).

Negative impacts have also been reported for other forms of internet use, such as online gambling. Case studies show that excessive online gambling is associated with serious consequences, including suicide. Different types of stress are risk factors for

developing anxiety disorders and can result in or worsen sleep disturbances. Stress can trigger depression, which can be exacerbated by anxiety (Sserunkuuma, et.al, 2023).

In addition, the digital platform provides e-businesses that provide social connection and interaction, virtual teaching and learning, religious activities and spiritual support, as well as social, emotional, and economic support (Sserunkuuma, et.al, 2023). Increased internet use is making it easier for students to access mental health services, such as online therapy sessions, at a time when stress, anxiety and depression are on the rise. The positive impact of online Internet use on well-being, relationship quality, and social connectedness is explained by the hypothesis that self-openness is enhanced through Internet use, which has been used by other researchers (Sserunkuuma, et.al, 2023). It should be noted that not everyone who frequently uses the Internet will most likely experience problems using the Internet. Its most extreme form is called internet addiction. Differences and personality characteristics reportedly play an important role (Sserunkuuma, et.al, 2023).

For example, in theories of use and satisfaction, different personality traits lead to different motives for Internet use, different types of addiction, or different motives for certain types of problematic Internet use (Sserunkuuma, et.al, 2023). Personal characteristics such as gender, age, education level, and expectations of Internet use also constrain the use of online communication applications, such as social media addiction (Sserunkuuma, et.al, 2023).

4. Conclusions

The main goal of the study was to clarify the relationship between smartphone addiction and various factors such as stress, anxiety, depression, and sleep quality. There is a very significant positive relationship between smartphone addiction and stress, as well as between smartphone addiction and anxiety. In addition, moderate associations were found between smartphone use and penetration quality, as well as between smartphone use and depression. Therefore, prevention of smartphone addiction among the younger generation needs to be done to avoid problematic behaviors such as stress, anxiety, depression, and insomnia.

Bibliography

Alabdallat, Y., Albakri, K. A., Al-Hanaqtah, B. M., Al-Dajani, M. H., Saleh, O. M., & Harvey, H. (2023). The Association between Smartphone Addiction, Depression and Anxiety among Medical Students in Jordan. *Jordan Medical Journal*, *57*(1). https://doi.org/10.35516/jmj.v57i1.1102

Chatterjee, S., & Kar, S. K. (2021). Smartphone addiction and quality of sleep among Indian medical students. *Psychiatry*, *84*(2), 182-191. https://doi.org/10.1080/00332747.2021.1907870

Choksi, S. T., & Patel, N. (2021). A study to find out the correlation of mobile phone addiction with anxiety, depression, stress and sleep quality in the college students of Surat city. *Int. J. Curr. Res. Rev*, *13*, 137-142. https://doi.org/10.31782/ijcrr.2021.13812

Feng, Z., Diao, Y., Ma, H., Liu, M., Long, M., Zhao, S., ... & Wang, Y. (2022). Mobile phone addiction and depression among Chinese medical students: the mediating role of sleep quality and the moderating role of peer relationships. *BMC psychiatry*, *22*(1), 567. https://doi.org/10.1186/s12888-022-04183-9

Gica, S., Yunden, S., Kirkas, A., Sevil, F., Ozdengul, F., & Ak, M. (2020). The Effect of Social Media/Smartphone Addiction and Sleep Quality on Academic Success in Medical Faculty Students. *Selcuk University Medical Journal*, *36*(4). https://doi.org/10.30733/std.2020.01471

Hadi, A. A., Nawawi, H. M. M., Shamsuri, N., Rahim, N. N., & Pasi, H. (2019). Smartphone Addiction and Its Relationship with Psychological Health among Clinical Years Medical Students of International Islamic University Malaysia (IIUM), Kuantan. *IIUM Medical Journal Malaysia*, *18*(3). https://doi.org/10.31436/imjm.v18i2.572

Kalyani, B., Reddi, N., Ampalam, P., Kishore, R., & Elluru, S. (2019). Depression, anxiety and smartphone addiction among medical students. *IOSR Journal of Dental and Medical Sciences*, *18*(2), 33-37.

Lei, L. Y. C., Ismail, M. A. A., Mohammad, J. A. M., & Yusoff, M. S. B. (2020). The relationship of smartphone addiction with psychological distress and neuroticism among university medical students. *BMC psychology*, *8*, 1-9. https://doi.org/10.1186/s40359-020-00466-6

Leow, M. Q. H., Chiang, J., Chua, T. J. X., Wang, S., & Tan, N. C. (2023). The relationship between smartphone addiction and sleep among medical students: A systematic review and meta-analysis. *Plos one*, *18*(9), e0290724. http://dx.doi.org/10.1371/journal.pone.0290724

Li, L., Wang, L., & Wang, X. (2022). Effect of smartphone use before bedtime on smartphone addiction behaviors among Chinese college students. *Frontiers in Psychology*, *13*, 1023245. https://doi.org/10.3389/fpsyg.2022.1023245

Li, Y., Li, G., Liu, L., & Wu, H. (2020). Correlations between mobile phone addiction and anxiety, depression, impulsivity, and poor sleep quality among college students: A systematic review and meta-analysis. *Journal of behavioral addictions*, *9*(3), 551-571. https://doi.org/10.1556/2006.2020.00057

Liu, H., Zhou, Z., Zhu, E., Huang, L., & Zhang, M. (2022). Smartphone addiction and its associated factors among freshmen medical students in China: a cross-sectional study. *BMC psychiatry*, *22*(1), 308. https://doi.org/10.1186/s12888-022-03957-5

Nikolic, A., Bukurov, B., Kocic, I., Vukovic, M., Ladjevic, N., Vrhovac, M., ... & Sipetic, S. (2023). Smartphone addiction, sleep quality, depression, anxiety, and stress among medical students. *Frontiers in Public Health*, *11*. https://doi.org/10.3389/fpubh.2023.1252371

Paudel, L., Sharma, P., Kadel, A. R., Lakhey, K., Singh, S., Khanal, P., ... & Pradhan, S. N. (2021). Association between internet addiction, depression and sleep quality among undergraduate students of medical and allied sciences.

Santander-Hernández, F. M., Peralta, C. I., Guevara-Morales, M. A., Díaz-Vélez, C., & Valladares-Garrido, M. J. (2022). Smartphone overuse, depression & anxiety in medical students during the COVID-19 pandemic. *PLoS One*, *17*(8), e0273575. https://doi.org/10.1371/journal.pone.0273575

Song, Y., Sznajder, K., Cui, C., Yang, Y., Li, Y., & Yang, X. (2022). Anxiety and its relationship with sleep disturbance and problematic smartphone use among Chinese medical students during COVID-19 home confinement—A structural equation model analysis. *Journal of affective disorders*, *296*, 315-321. https://doi.org/10.1016/j.jad.2021.09.095

Sserunkuuma, J., Kaggwa, M. M., Muwanguzi, M., Najjuka, S. M., Murungi, N., Kajjimu, J., ... & Ashaba, S. (2023). Problematic use of the internet, smartphones, and social media among medical students and relationship with depression: An exploratory study. *Plos one*, *18*(5), e0286424. https://doi.org/10.1371/journal.pone.0286424

Stanković, M., & Nešić, M. (2022). Association of internet addiction with depression, anxiety, stress, and the quality of sleep: Mediation analysis approach in Serbian medical students. *Current Research in Behavioral Sciences*, *3*, 100071. https://doi.org/10.1016/j.crbeha.2022.100071

Wattanaudomchai, A., Tangwongchai, S., & Lalitanantpong, D. (2023). Depression, smartphone addiction, and association factors among preclinical medical students. *Chulalongkorn Medical Journal*, *67*(2).

Xu, T., Sun, X., Jiang, P., Chen, M., Yue, Y., & Dong, E. (2022). Effects of cell phone dependence on mental health among college students during the pandemic of COVID-19: a cross-sectional survey of a medical university in Shanghai. *Frontiers in Psychology*, *13*, 920899. https://doi.org/10.3389/fpsyg.2022.920899

Zhang, C., Zeng, P., Tan, J., Sun, S., Zhao, M., Cui, J., ... & Liu, D. (2021). Relationship of problematic smartphone use, sleep quality, and daytime fatigue among quarantined medical students during the COVID-19 pandemic. *Frontiers in psychiatry*, *12*, 755059. https://doi.org/10.3389/fpsyt.2021.755059